

Results from EDDA@COSY: Spin observables in Proton-Proton Elastic Scattering*

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Elastic proton-proton scattering as one of the fundamental hadronic reactions has been studied with the internal target experiment EDDA at the Cooler-Synchrotron COSY/Jülich. A precise measurement of differential cross section, analyzing power and three spin- correlation parameters over a large angular ($\theta_{c.m.} \approx 35^\circ - 90^\circ$) and energy ($T_p \approx 0.5 - 2.5$ GeV) range has been carried out in the past years. By taking scattering data during the acceleration of the COSY beam, excitation functions were measured in small energy steps and consistent normalization with respect to luminosity and polarisation. The experiment uses internal fiber targets and a polarized hydrogen atomic-beam target in conjunction with a double-layered, cylindrical scintillator hodoscope for particle detection. The results for differential cross-sections [2] and analyzing powers [3] will be presented and the influence on phase-shift analysis [4, 5] discussed.

Recently data taking with polarized beam and target has been completed. Preliminary results for the spin-correlation parameters A_{NN} , A_{ss} , and A_{SL} will be presented. The observable A_{ss} has been measured the first time above 800 MeV and our results are in sharp contrast to phase-shift predictions [5, 6] at higher energies. Our analysis shows that some of the ambiguities in the direct reconstruction of scattering amplitudes [6] which also show up as differences between available phase-shift solutions [5, 6], will be reduced by these new measurements.

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